

IMPORTANT FOREST INSECT OUTBREAKS**California Region, 1957**

Timber losses due to insects have shown a marked increase in California for 1957, and in many areas critical epidemics are now underway. The western pine beetle in ponderosa pine and the mountain pine beetle in sugar pine increased substantially killing timber statewide, particularly around some of the major 1955 burns. The Jeffrey pine beetle was in outbreak in many parts of the State. The mountain pine beetle and lodgepole needle miner in lodgepole pine persisted at epidemic levels and jointly killed entire stands of lodgepole in Yosemite National Park. The California flatheaded borer remained in outbreak in southern California. The Douglas-fir beetle again showed grouping tendencies in northwestern California after reaching a very low level in 1956. The red turpentine beetle was unusually abundant in association with the western pine beetle on ponderosa pine, and mountain pine beetle on sugar pine. Seed and cone insects caused serious damage statewide to the very light cone crop of 1957. Other miscellaneous insects causing local damage included pine sawflies, the pine reproduction weevil, a native pine-tip moth, the Great Basin tent caterpillar, the black pine-leaf scale, the needle-sheath miner and the Jeffrey pine needle miner. An introduced spruce needle miner was discovered for the first time in California on ornamental spruce at Alturas. There was very extensive tip-killing of ponderosa, Jeffrey and sugar pine covering many thousand acres from Shasta County to Fresno County. Secondary bark beetles were found associated with the damage, but some adverse climatic factor may have been initially responsible for the damage.

In spite of the heavy killing of timber by insects in California for 1957 the net economic loss has been very materially reduced by sanitation-salvage and prompt salvage of infested trees. Many major timber operators in the pine region conducted such programs, either as part of their main operation, or through special programs where their full production potential has been directed to bark beetle control.

Western pine beetle - *Dendroctonus brevicornis* Lec.

Host: Ponderosa pine and Coulter pine

Current conditions: The western pine beetle was very aggressive in many parts of the State and caused serious damage on portions of the Sierra, Sequoia, Plumas, Stanislaus, Tahoe, Mendocino, and Klamath National Forests, and Sequoia-Kings Canyon and Yosemite National Parks. Two particularly serious epidemics occurred around two of the major 1955 burns. One was around the McGee Burn, on the Sequoia National Forest and the Sequoia-Kings Canyon National Park. This outbreak covered some 73,000 acres, with an estimated 7,750 infested trees comprising about 6.1 million board-feet. It was the most serious pine bark-beetle epidemic in California since the 1944-45 Burney-McCloud infestation. Considerable progress was made in controlling the infestation through use of chemicals and salvaging infested trees. By late fall, approximately 4 million board-feet of infested material was salvaged and another 2 million board-feet treated with chemicals. Further control action is likely to be necessary to mop up this infestation in the spring.

Another similar situation developed around the Haystack Burn on the Klamath National Forest. The infestation there covered over 100,000 acres with several

thousand trees containing several million board-feet infested. Some progress has been made in salvaging infested trees, but a major control effort probably will be needed in this area in the spring.

In spite of the general upswing of loss by the western pine beetle statewide, it is encouraging to report that extensive areas treated by sanitation-salvage showed no appreciable increase. At Blacks Mountain, where sanitation-salvage has been undergoing tests, losses on untreated areas were 207 board-feet per acre, (the highest in 20 years) compared to 56 board-feet per acre on the treated areas.

Trend: A definite upward trend.

Mountain pine beetle - *Dendroctonus monticolae* Hopk.

Host: Lodgepole and sugar pines

Current conditions: Losses in lodgepole pine caused by the mountain pine beetle continued at a very high level in the Dingley and Delaney Creek drainages in Yosemite National Park in trees severely weakened by needle miner defoliation. An appraisal of bark beetle damage revealed about 1,365 large trees infested, on about 4,400 acres. This represents a very substantial increase over the previous year's loss, in spite of control work carried on.

Although no appraisal was made in the South Warner area on the Modoc, general observations indicated that the mountain pine beetle infestation in lodgepole pine there continued unabated. In the latter case, the land-managing agency decided against control after weighing all the economic factors.

Losses in mature sugar pine due to the mountain pine beetle increased generally statewide. They were especially heavy around the McGee Burn on the Sequoia N.F. and Haystack Burn on the Klamath, in the Pinecrest area on the Stanislaus, the Strawberry area on the Plumas and the Callahan area on the Klamath.

Trend: Definitely upward in both lodgepole and sugar pine.

Lodgepole needle miner - *Recurvaria milleri* Busck.

Host: Lodgepole pine

Current conditions: Heavy defoliation persisted on about 50,000 acres in Yosemite National Park. 1957 was a flight year and it is suspected that new areas were invaded by moths. In areas where defoliation has been heavy for several generations, many trees were killed by defoliation alone. In these same areas heavy group-killing by the mountain pine beetle also took place, as noted above.

A pilot plant control operation was undertaken late this summer in cooperation with the National Park Service to control the needle miner with malathion sprays applied by helicopter. In one test against the moths a dose of 2 lbs. in 20 gals. of diesel oil per acre reduced the population by about 60 percent. In other tests, comparable doses applied against the newly hatched larvae reduced the population by about 70 percent. Further tests are planned to improve the percentage kill.

Trend: Continuing at a high level.

Jeffrey pine beetle - *Dendroctonus jeffreyi* Hopk.

Host: Jeffrey pine

Current conditions: The Jeffrey pine beetle was epidemic ^{some} on 105,000 acres in the Cannel Meadows area, Sequoia N.F., and on the Deadman and Deer Mountain areas, Inyo N.F., and Dodge Mine area on the Plumas N.F. A spring survey in the Cannel Meadows area indicated a loss of about 50 million board-feet of timber during 1955 and 1956 with most of the loss caused by the Jeffrey pine beetle.

Trend: Continuing at a high level.

Douglas-fir beetle - *Dendroctonus pseudotsugae* Hopk.

Host: Douglas-fir

Current conditions: Douglas-fir beetle damage reached a very low level in the State in 1956 with practically no grouping tendency observed. This year there was some grouping reported on the Klamath and Six River National Forests in the same general areas where epidemics were experienced in previous years.

Trend: Upward for the north coast region, low in other parts of the State.

Fir-engraver - *Scolytus ventralis* Lec.

Host: White and red firs

Current conditions: Losses from the fir engraver were moderate for the State as a whole with some tendency for local epidemics on the Stanislaus and Sequoia N.F.

Trend: Generally low.

Pine engravers - *Ips confusus* Lec. and *I. oregoni* (Eichh.)

Host: Ponderosa, Coulter and Jeffrey pine

Current conditions: Losses from pine engravers were generally low over the State as a whole except for a few local outbreaks in the southern California recreation forest and scattered loss in the northern Sierra foothills.

Trend: Generally low for the State.

Douglas-fir tussock moth - *Hemerocampa pseudotsugata* McD.

Host: White fir

Current conditions: A 10,000 acre Douglas-fir tussock moth outbreak on the Stanislaus N.F. was controlled by aerial spraying with DDT in 1956. There was no recurrence of this outbreak this year. No larvae or egg masses were found in 1957. In areas heavily defoliated last season, surveys showed that 21 percent of the trees had died either from defoliation alone, or from defoliation and other factors.

Trend: Low level.

The California flatheaded borer - *Melanophila californica* Van D.

Host: Jeffrey and ponderosa pine

Current conditions: The California flatheaded borer continued in an epidemic status in southern California. The borer was particularly serious in the Mt. Laguna recreation area, Cleveland N.F. A recent appraisal conducted in this area indicates that approximately 13,000 trees on some 7,500 timbered acres died in 1957. Of this number, 83 percent were infested with flathead larvae. The volume loss per acre due to this insect was 150 board-feet or about 2.4 percent of the residual stand.

Trend: Continuing high level.

Pine reproduction weevil - *Cylindrocopturus eatoni* Buch.

Host: Ponderosa and Jeffrey pine

Current conditions: This insect continued to cause serious damage to local pine plantations. One new center of infestation was detected on the Eldorado N.F. in a hybrid out-planting. An outbreak on about 400 acres in the Mt. Shasta brush-field planting, Shasta-Trinity N.F., was controlled through the aerial application of DDT late in June.

Trend: Variable.

Seed and cone insects

Seed and cone insects have caused very serious damage to a generally light pine seed crop. It is estimated that 85 to 90 percent of the sugar-pine cone crop was destroyed by the sugar-pine cone beetle, *Conophthorus lambertianae* Hopk. Reduction in the seed crop of Jeffrey pine seed cones from pine seed worms is placed at 75 to 80 percent. There was practically no ponderosa pine cone crop, but such cones as were produced were almost completely destroyed. The very light Douglas-fir cone crop was practically wiped out by insects. Cone moth larvae (*Diaryctria* and *Barbara* spp.) damaged 46 percent of the cones and 82 percent (includes some of the moth-infested cones) were infested by gall midges. Of the seed that escaped these pests, 74 percent were destroyed by seed chalcids (*Megastigmus*). The cone crop in true firs was generally fair, statewide, but damage from insects was very high.

Trend: Upward in all species.

Submitted by
California Forest and Range Experiment Station
Division of Forest Insect Research
Berkeley, California

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Agriculture--Forest Service, Berkeley, Calif.